

end of the first generation. The compound name of *vernalis-ampla-croceus* might in some localities and years be applied to the fourth generation, to be exact. There thus exists: *C. hyale*, L., race *hyale*, L.: I. gen. *vernalis*, Vrtv.; II. gen. *hyale*, L.—*C. hyale*, L., race *calida*, Vrtv.: I. gen. *vernalis*, Vrtv.; II. gen. *calida*, Vrtv.; III. gen. *calida*, Vrtv.; IV. partial emergence or extraordinary gen. *hyale*, L.—*C. croceus*, Fourcr., race *croceus*, Fourcr.: I. gen. *vernalis*, Vrtv.; II. gen. *ampla*, Vrtv.; III. gen. *croceus*, Fourcr.; IV. partial gen. *vernalis-ampla-croceus*, Vrtv.-Fourcr. (in some localities and years), or *autumnalis*, Rocci. According to Tutt, as far north as England, the individuals of *C. croceus* which reach it in the spring may, in favourable years, produce two other generations. As the different features of the various generations have only so recently been established in the south, where they are probably more prominent, we have as yet no knowledge as regards these in Central Europe, including Paris, whence the species was described. That is why I abstain from designating the southern race by a different name. It may be that *ampla* is peculiar to it and should be used for the entire race, as distinguished from race *croceus*, consisting only of *vernalis* and *croceus*. Barrett records, however, that in June, 1877, particularly large and bright *croceus* were produced in Pembrokeshire by larvæ which had survived the English winter, extremely mild that year; they may have been *ampla*, but anyhow, this remark shows that in the north seasonal polymorphism is much more erratic than in the south, because the small *vernalis* was cut out.

(To be continued.)

### Notes on the Zygænidæ of Provence (France).

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

One of my objects in visiting Provence in 1920 was to investigate, so far as circumstances might permit, the local races of the genus *Zygaena*. The distribution of *Z. astralagi*, Bkh. = *hippocrepidis*, Hb., is as far as I can trace quite a matter of hypothesis, as is its relation to *Z. transalpina*, Esp., and also to *Z. alpina*, Boisd. I take it for granted that all those who have studied this group are now satisfied that none of these species, including also *Z. angelicæ*, are local races of either *Z. filipendulæ* or *Z. stoehadis*; whilst another point of interest is the relation of this group with the little assemblage of species named by Oberthür *centralis*, i.e., *centralis-centralis*, *centralis-occidentalis*, and *centralis-provincialis*. Before considering this question I should like to again raise the synonymical value of *Z. loti*, Schiff. Dr. Verity is of the opinion that the name should be used for *transalpina*, Esper, but he has unfortunately given us no reasons for such use. I went very fully into this synonymy in vol. 32, p. 76 (1920), of this magazine, and will not therefore repeat it here except to remind my readers that judging from Esper's figure, *loti*, Esp., is probably *filipendulæ* var. *cytisi*, and *loti-vera* (*loti*, Schiff.) is most likely referable to *meliloti*. With the name *loti*, I shall shortly deal in detail. But to return to the *Zygaenidæ* I observed in Provence.

From the point of view of numbers actually captured and seen *Zygaena centralis* v. *provincialis* was much the most abundant. I took about one hundred-and-fifty specimens at la Sainte Baume and at

Mont Ventoux; Monsieur Oberthür has very kindly sent me labelled specimens of the various forms (referred to in his *Lepidoptera Comparée*) of the *transalpina*, *filipendulae*, and *loniceræ* groups, so that I am fortunate in having his determinations, and the majority of my Sainte Baume specimens are thoroughly typical of the specimens he sent me, which were taken in Var and also at Montrioux. In a long series we, of course, find variations, and many of my specimens have broad margins to the secondaries, there is, however, wonderfully little variation in the spots of the primaries, there are a very few specimens with largish spots, but even this is rare. The series from Mont Ventoux is not quite typical. Here I took about twenty-five specimens and all have the margins to the secondaries almost linear, whilst the spots in the primaries are decidedly larger in all the specimens, and in half of them they are more or less inclined to confluence, but not to the extent obtaining in *centralis-occidentalis*, these are a well marked group and apparently *centralis* will prove to be a distinct species. In the neighbourhood around St. Martin Vésubie the species belonging to the *transalpina* section that I found plentifully was *maritima*, Obth., it also seems to be easily distinguishable.

Monsieur Oberthür kindly sent me half-a-dozen specimens labelled *hippocrepididis* v. *alpina*—no doubt this is Boisduval's insect. Whilst at Digne in 1911, and again the year before last, I took a fair series of a *Zygaena* in the Dourbes mountains and elsewhere that I have endeavoured to fit in with Oberthür's examples, but I cannot make them agree either in the pattern or in structure. I have dissected out the genitalia of each and there are certainly two species, that is to say *alpina* does not agree with my series from Digne, and I regret that I cannot yet identify with any certainty my specimens though I hope to do so later. *Zygaena filipendulae*, *Z. trifolii*, *Z. loniceræ*, *Z. fausta*, and *Z. carniolica* will be referred to later on, but it is interesting to note that at Old Nans, some 800 feet below la Sainte Baume, I took a single specimen of *Z. occitanica*. In no place did I take *transalpina* and *centralis* together, the latter in its form *centralis-provincialis* seems to replace *transalpina* at la Sainte Baume.

The most interesting feature of this genus in this district is the fact that at la Sainte Baume I took a fair series of *filipendulae*, about two dozen individuals, and that half of them are a five-spotted form. I could have taken many more but did not realise that I was taking two species until I came home, and even then it was only (being somewhat doubtful of one or two specimens) the examination of the genitalia that revealed for certain what I had before me. The specimens in question are rather smaller than the average six-spotted *filipendulae*; they are somewhat thinly scaled and of slighter build, generally the margin of the hindwings is narrowly black, but in several specimens it is as wide as in the *trifolii* that I took alongside them, and as a matter of fact in the first instance I placed all the five-spotted form under that species, especially as most had not a sixth spot on the underside. I took also several at Digne and one at St. Martin Vésubie; these, however, unlike the majority of those from la Sainte Baume, have a well marked trace of the sixth spot on the under-surface. It seems to me that we have a well marked form being here developed and that it is quite worthy of a name. I therefore propose to call it *filipendulae* var. *quinquemacula*, the la Sainte Baume

specimens being the type form. *Zygæna trifolii* in its race *orobi* was common at la Sainte Baume, but I did not take it elsewhere, except that I captured one typical *trifolii*, i.e., with the central spots confluent, at Bedoin.

*Z. loniceræ* was rare at la Sainte Baume, but very common in its fine race *major*, Fr., everywhere around St. Martin Vésubie, where I took a long and beautiful series. Four specimens of *Z. meliloti* fell to my net. I do not know whether this species has been recorded from la Sainte Baume before, the genitalia prove them to be this insect though I had no doubt of it from their general appearance. *Z. stoehadis* var. *dubia*, Sgr., was very common at St. Martin Vésubie especially in the higher parts, the specimens being large and handsome and also somewhat variable; the great majority had five spots in the primaries but I took a few six-spotted specimens. The hindwings were likewise variable, all being richly red, but the dark borders varied considerably, some were comparatively narrow and very even in width; some few had very broad borders with the fold well invaded below vein 2; whilst between these two extremes there are many grades. I did not take this species at la Sainte Baume at all.

We spent two or three days at Digne, and in that short visit I netted three specimens of *Z. ephialtes*, but none were of the type form. I took one *peucedani*, one *pinzi*, and one *aurantiaca*.

Turning now to the *carniolica* section, this species was not rare at la Sainte Baume, all the specimens being of the *hedysari* form. I took but one at St. Martin Vésubie, which is the var. *diniensis*; at Digne the species was very common, the majority being also of the *diniensis* variety, but I took a fair series of the type form also, these being smaller than Herrich-Schäffer's variety. *Z. fausta* occurred sparingly at la Sainte Baume, it was only coming out as we left. At Mont Ventoux where it was going over I took several nice specimens, whilst at Digne it was very common indeed, though all were of the type race.

*Z. achilleæ* occurred only at Digne, where it was not uncommon, in July. Of *Z. briçæ* I took a small series at la Sainte Baume, where I also captured two specimens of *Z. sarpedon*. *Z. purpuralis* did not occur at la Sainte Baume, that is to say, we did not take it there, but it was common around St. Martin Vésubie. Of the genus *Ino* I took but three specimens, one beautiful male of *I. pruni* and two worn males of *I. statice* var. *crassicornis*.

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### The Farn Collection.

On March 14th last the sale of the above was continued, the first 196 lots comprising the remainder of the Rhopalocera.

A dark *Pararge aegeria* fetched 20s. and another dark form with spotless hindwings, 35s.

*Pararge megera* var. *bipupillata* (*alberti*) realised 5s., 7s. and 8s. per lots of two, three and six. Series of *Coccygnypa tiphon* from various localities realised 42s., and two lots of undersides each of 48 and 46, 60s. and 80s. Included in these were several fair forms of the rare aberration *lanceolata*. Fifty-one *Erebia aethiops*, several slightly varying, fetched 56s., and 53 undersides 20s.

The series of *Thecla*s included nothing special, excepting a broadly orange banded *Thecla pruni*, which realised with others £2 2s.